THE ROCKEFELLER UNIVERSITY

pro bono humani generis

1230 YORK AVENUE - NEW YORK, NEW YORK 10021-6399

Joshua Lederberg
UNIVERSITY PROFESSOR

May 6, 1992

My dear Alföldi:

I was certainly very much interested to get your letter of April 30, and would enjoy getting more details.

Several different issues have to be dissected.

As to streptomycin effect: there certainly is a polarity, distinguishing Hfr,Sr x F-,Ss versus Hfr,Ss x F-,Sr. But I have never accepted that as more than the measure of streptomycin poisoning the cytoplasm of the F- cell. The so-called "killing" of Ss cells is merely the inhibition of outgrowth, and they could be at any level of genetic or metabolic activity, including the reversal of viability you call "persisters". I am not sure that these per se have to be invoked for the success of that cross.

As to progressive transfer, I would say that the timing of first "entry" is fairly persuasive that there is such a process, but by no means is it certain that it accounts for the whole story. In fact, to this day there has never been a comprehensive analysis of the LINKAGE patterns as a function of time of conjugation.

My intuition (backed by modest evidence) is that multiple breaks ensue in BOTH the donor and recipient chromosomes, resulting in possible segmental eliminations from either parent, all this in addition to the limited transfer of the male chromosome under conditions of interrupted mating. Perhaps the single-stranded, broken(?) male chromosome initiates a more generalized SOS reaction, N.B.:

Kunz-BA Glickman-BW #
The Infidelity of Conjugal DNA Transfer in Escherichia-Coli
GENETICS 105: 489-500 1983

At any rate, my old data on segregation from transient diploids did give some hints for this; but I made the mistake of insisting that this was an alternative, rather than a complement, to the other processes.

I am on to other studies now; but I hope someone will be able to undertake a more comprehensive experimental examination of what happens to all the early markers with prolonged matings, and, perhaps selection for the late entry ones. It would probably be helpful to do this in conjunction with the isolation of unsegregated diploids, which can be selected as e.g., balanced heterozygotes Lacz+y-/z-y+. Of course we know how to watch out for F-primes and similar anomalies.

With best regards,

PS5 54.1b cc: Luca